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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/603,737 | 06/26/2003 | Teruhito Ohnishi | 60188-540 | 4861 |

7590 03/25/2004
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600 13th Street, N.W.
Washington, DC 20005-3096

| EXAMINER |
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GUERRERO, MARIA F

| ART UNIT | PAPER NUMBER |
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2822

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/603,737

Applicant(s)

OHNISHI ET AL.

Examiner

Maria Guerrero

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6-26-03.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-10 is/are allowed.
- 6) ☒ Claim(s) 11 and 13 is/are rejected.
- 7) ☒ Claim(s) 12 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 10/009,201.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to the Preliminary Amendment filed June 26, 2003.

Claims 1-5 are canceled.

Claims 6-14 are pending.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 11 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Asai et al. (EP 1037284 A2).

Asai et al. teaches epitaxially growing a p-type second single-crystal semiconductor layer as a base layer on an n-type first single-crystal semiconductor layer functioning as a collector layer on a substrate (col. 16, lines 45-50, col. 20, lines 10-15). Asai et al. shows epitaxially growing a third single-crystal semiconductor layer

on the second single-crystal semiconductor layer (col. 20, lines 10-15, col. 24, lines 3-5). Asai et al. discloses doping at least an upper portion of the third single-crystal semiconductor layer with a p-type impurity by implanting ions of the p-type impurity (col. 18, lines 15-30). Asai et al. teaches forming a semiconductor layer containing phosphorus on the third single-crystal semiconductor layer (col. 19, lines 20-30, col. 20, lines 10-15, col. 26, lines 40-47). Asai et al. shows performing heat treatment for diffusing phosphorus in order to dope the third single-crystal semiconductor layer with phosphorus in a concentration higher than the concentration of the p-type impurity to form an emitter of a bipolar transistor (col. 21, lines 1-10, col. 26, lines 37-47).

Allowable Subject Matter

4. Claims 6-10 are allowed.
5. Claims 12 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: in the examiner's opinion, it would not have been obvious to a person of ordinary skill in the art at the time of the invention to modify the cited references in order to include the steps of: depositing a semiconductor layer on the third single -crystal semiconductor layer having the phosphorous concentration on the upper and bottom portion in the specific order as claimed, simultaneously growing and doping the third single-crystal semiconductor layer with p-type impurity, forming an insulating layer on

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the third single-crystal semiconductor layer and a semiconductor layer containing a p-type impurity and introducing the p-type impurity into the third single-crystal semiconductor layer from the semiconductor layer via the insulating layer in combination with the other limitations on the claims. There is not motivation or suggestion to modify the references in order to meet these specific limitations.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Asai et al. (U.S. 6,455,364), Taka et al. (U.S. 4,975,381), Takagi et al. (U.S. 6,492,711), Kabir et al. (U.S. 6,346,452), and Takemura (U.S. 5,587,326) teach several steps pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 571-272-1837.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Maria Guerrero
Maria Guerrero
Primary Examiner
February 25, 2004